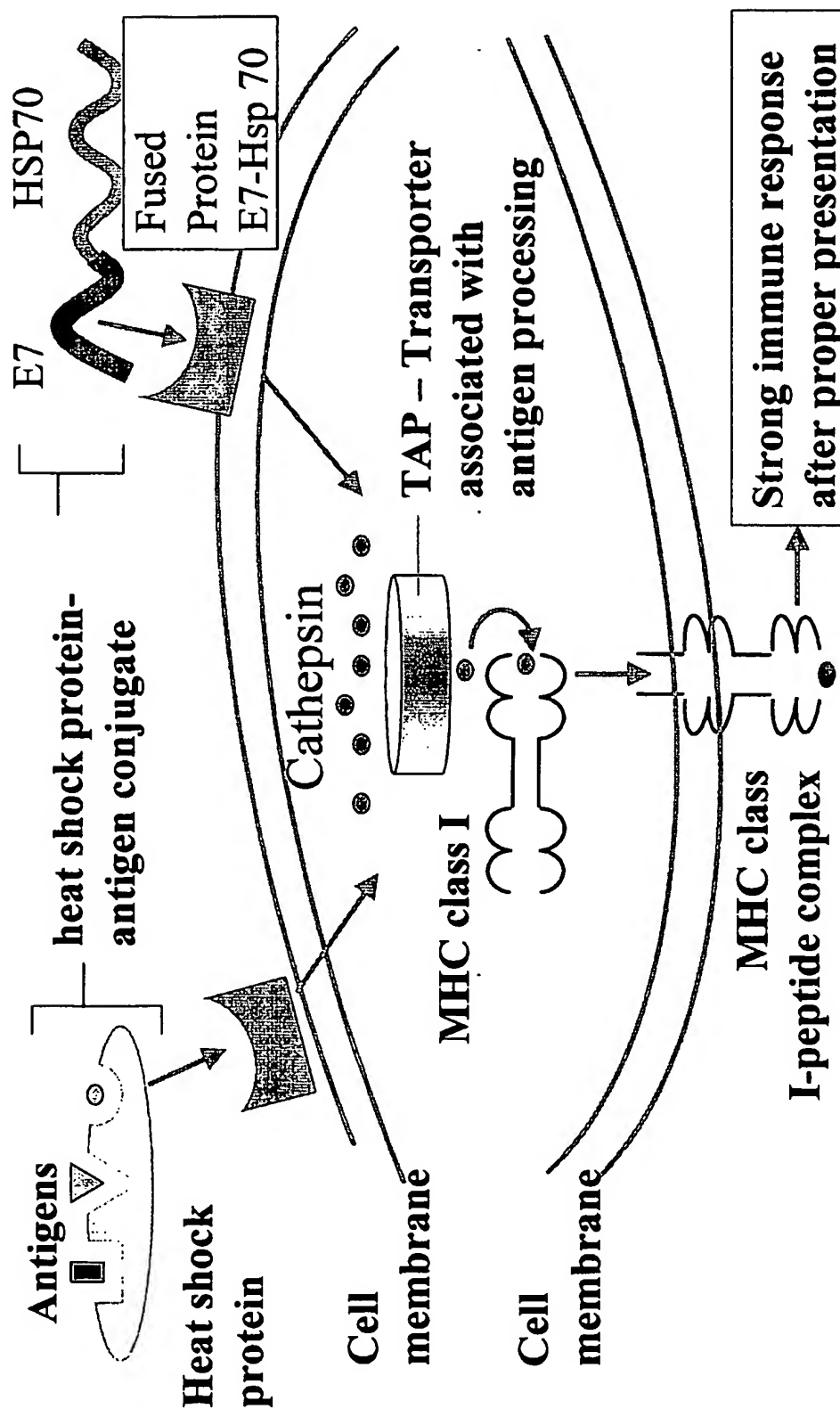


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Fig. 1



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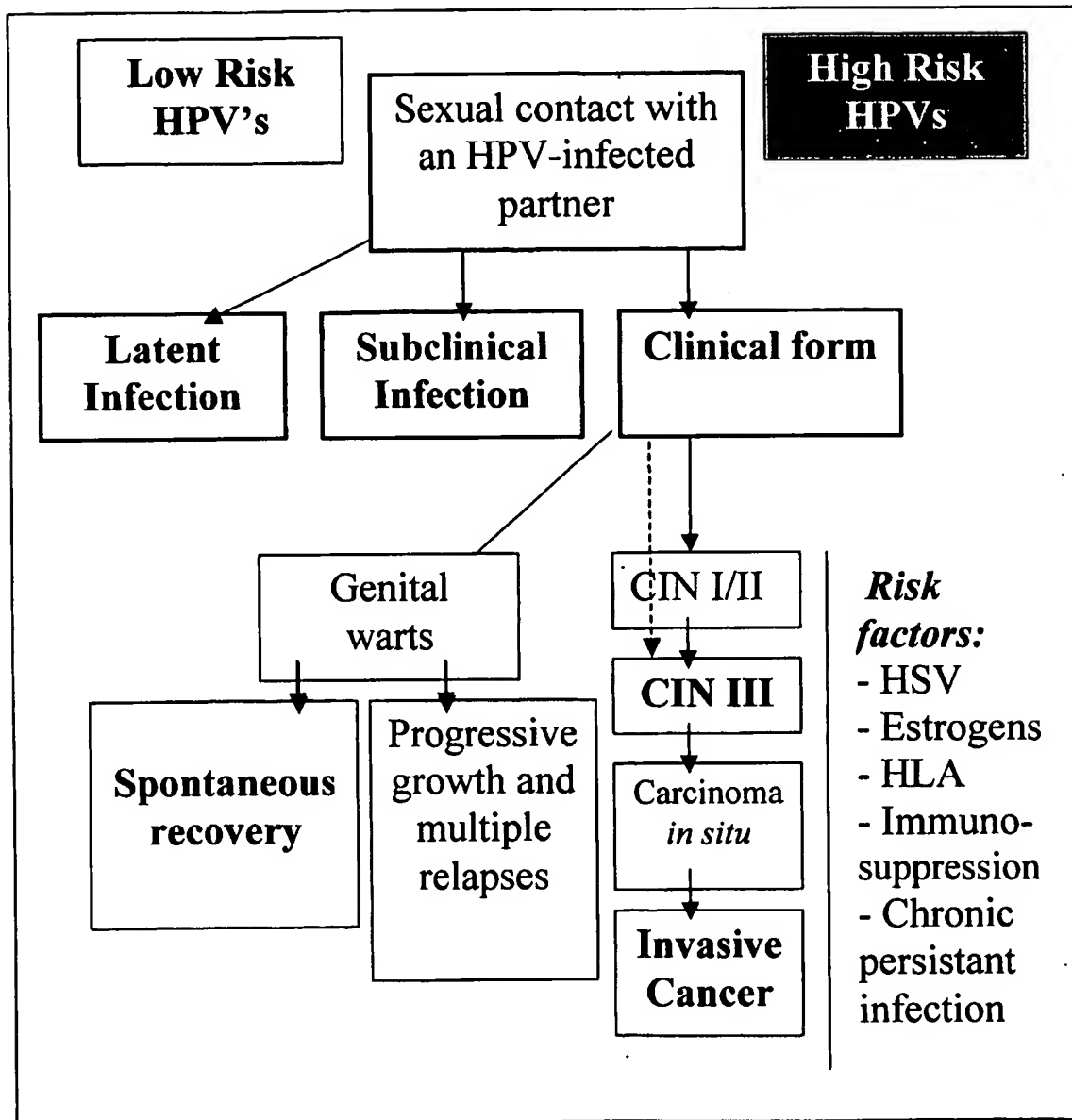


Fig. 2

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18UP 5-TCT AAC GAA TTC AGT ATG CAT GGA CCT AAG G (SEQ ID NO.: 14)
 18 DOWN 5-ATT ACA GGA TCC CTG CTG GGA TGC ACA CCA (SEQ ID NO.: 15)
 16UP 5-ATT CTC GAA TTC ATC ATG CAT GGA GAT ACA C (SEQ ID NO.: 16)
 16 DOWN 5-CTT ATC GGA TCC TGG TTT CTG AGA ACA GAT G (SEQ ID NO.: 17)

Fig. 3

gaattcatcatgcattggagatacacctacattgcatgaatatatgttagatttgcaacca
 EcoRI I M H G D T P T L H E Y M L D L Q P
 gagacaactgatctctactgttatgagcaattaatgacagctcagaggaggaggatgaa
 E T T D L Y C Y E Q L N D S S E E D E
 atagatgggtccagctggacaagcagaaccggacagagcccattacaatatgttaaccttt
 I D G P A G Q A E P D R A H Y N I V T F
 tgttgcaagtgtgactctacgcttcggttgtgcgtacaagcacacgtagacattcgt
 C C K C D S T L R L C V Q S T H V D I R
 actttggaagacctgttaatgggcacactaggaattgtgtgccccatctgttctcagaaa
 T L E D L L M G T L G I V C P I C S Q K
ccaggatcc
 P BamHI

Fig. 4

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gaattcagtatgcatggacctaagggaacattgcaagacattgtattgcatttagagccc
 EcoRI S M H G P K A T L Q D I V L H L E P
 caaatgaaattccggttgaccttctatgtcacgagcaattaagcgactcagaggaagaa
 Q N E I P V D L L C H E Q L S D S E E E
 aacgatgaaatagatggagttaatcatcaacatttaccagcccgacgagctgaaccacaa
 N D E I D G V N H Q H L P A R R A E P Q
 cgtcacacaatgttgatgtgttgtaagtgtgaagccagaattgagctagtagtagaa
 R H T M L C M C C K C E A R I E L V V E
 agctcagcagacaccttcgagcattccagcagctgttctgaacacccctgtcctttgtg
 S S A D D L R A F Q Q L F L N T L S F V
 tgtccgtggtgtgcattcccagcag**ggatcc**
 C P W C A S Q Q BamHI

Fig. 5

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T7 promoter →
TAATACGACTCACTATAGGAGACCACAACGGTTCCCTCTAGAAATAATTTGTTAACT
TTAAGAGGAGATATACATATGcatcaccatcacGAATTC – E7 gene HPV16(18) - GGATCC
rbs *Nde I* His-Tag *EcoRI* *BamHI*
TAATTAGCTGAAAGCTT
Termi *HindIII*

Fig. 6

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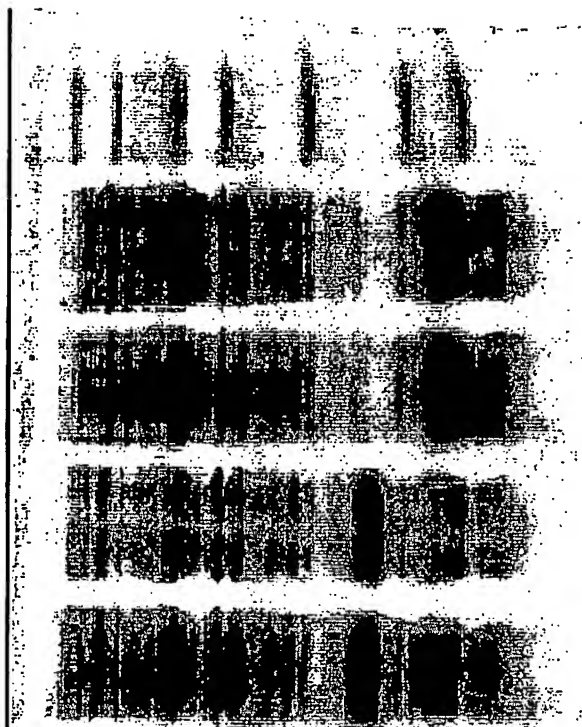


Fig. 7

Type 16 HPV7

Type 18 HPV E7

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Type 16

E716-F GA AGA TCT ATG CAT GGA GAT ACA CCT AC
(SEQ ID NO.:19) Bgl II

E716-R CG GGA TCC TGG TTT CTG AGA ACA GAT GG
(SEQ ID NO.:20) BamHI

Type 18

E718-F GA AGA TCT ATG CAT GGA CCT AAG GCA AC
(SEQ ID NO.:21) Bgl II

E718-R CG GGA TCC CTG CTG GGA TGC ACA CCA CG
(SEQ ID NO.:22) BamHI

Fig. 8

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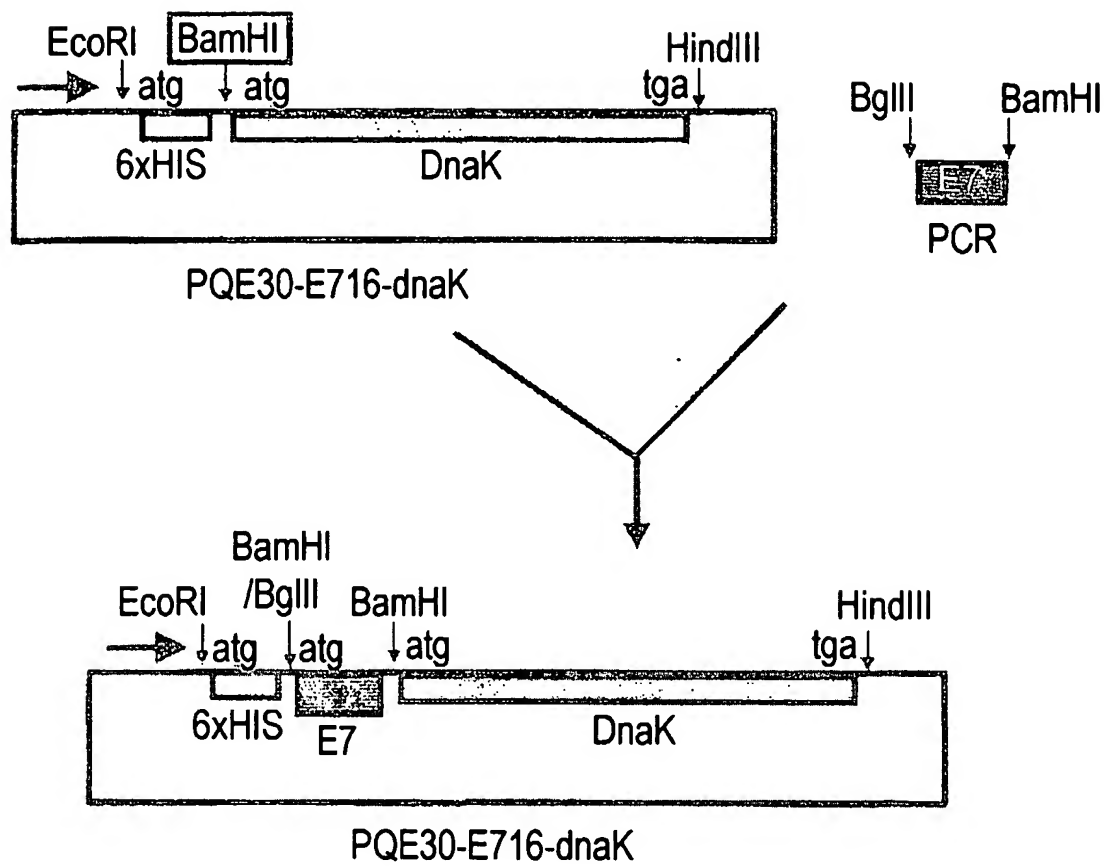


Fig. 9

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1  CTCGAGAAAT  CATAAAAAAT  TTATTTGCTT  TGTGAGCGGA  TAACAATTAT  AATAGATTCA
61 ATTGTGAGCG  GATAACAATT  TCACACAGAA  TTCATTAAAG  AGGAGAAATT  AACTATGAGA
121 GGATCGCATC  ACCATCACCA  TCACGGATCC  GCTCGTGCGG  TCGGGATCGA  CCTCGGGACC
181 ACCAACTCCG  TCGTCTCGGT  TCTGGAAGGT  GGCGACCCGG  TCGTCTGTCG  CAACTCCGAG
241 GGCTCCAGGA  CCACCCCGTC  AATTGTGCGG  TTCGCCCGCA  ACGGTGAGGT  GCTGGTCGGC
301 CAGCCCGCCA  AGAACCAGGC  AGTGACCAAC  GTCGATCGCA  CCGTGCGCTC  GGTCAAGCGA
361 CACATGGGCA  GCGACTGGTC  CATAGAGATT  GACGGCAAGA  AATACACCGC  GCCGGAGATC
421 AGCGCCCGCA  TTCTGATGAA  GCTGAAGCGC  GACGCCGAGG  CCTACCTCGG  TGAGGACATT
481 ACCGACGCGG  TTATCACGAC  GCCCGCCTAC  TTCAATGACG  CCCAGCGTCA  GGCCACCAAG
541 GACGCCGGCC  AGATCGCCGG  CCTCAACGTG  CTGCGGATCG  TCAACGAGCC  GACCGCGGCC
601 GCGCTGGCCT  ACGGCCTCGA  CAAGGGCGAG  AAGGAGCAGC  GAATCCTGGT  CTTCGACTTG
661 GGTGGTGGCA  CTTTCGACGT  TTCCCTGCTG  GAGATCGGCG  AGGGTGTGGT  TGAGGTCCGT
721 GCCACTTCGG  GTGACAACCA  CCTCGGCGGC  GACGACTGGG  ACCAGCGGGT  CGTCGATTGG
781 CTGGTGGACA  AGTTCAAGGG  CACCAGCGGC  ATCGATCTGA  CCAAGGACAA  GATGGCGATG
841 CAGCGGCTGC  GGAAGCCGC  CGAGAAGGCA  AAGATCGAGC  TGAGTTCGAG  TCAGTCCACC
901 TCGATCAACC  TGCCCTACAT  CACCGTCGAC  GCCGACAAGA  ACCCGTTGTT  CTTAGACGAG
961 CAGCTGACCC  GCGCGGAGTT  CCAACGGATC  ACTCAGGACC  TGCTGGACCG  CACTCGCAAG
1021 CCGTTCCAGT  CGGTGATCGC  TGACACCGGC  ATTTGCGTGT  CGGAGATCGA  TCACGTTGTG
1081 CTCGTGGGTG  GTTCGACCCG  GATGCCCGCG  GTGACCGATC  TGGTCAAGGA  ACTCACCGGC
1141 GGCAAGGAAC  CCAACAAGGG  CGTCAACCCC  GATGAGGTTG  TCGCGGTGGG  AGCCGCTCTG
1201 CAGGCCGGCG  TCCTCAAGGG  CGAGGTGAAA  GACGTTCTGC  TGCTTGATGT  TACCCGCTG
1261 AGCCTGGGTA  TCGAGACCAA  GGGCGGGGTG  ATGACCAGGC  TCATCGAGCG  CAACACCACG
1321 ATCCCCACCA  AGCGGTGCGA  GACTTTTACC  ACCGCCGACG  ACAACCAACC  GTCGGTGCAG
1381 ATCCAGGTCT  ATCAGGGGGA  GCGTGAGATC  GCCGCGCACA  ACAAGTTGCT  CGGGTCCTTC
1441 GAGCTGACCG  GCATCCCGCC  GGCGCCGCGG  GGGATTCCGC  AGATCGAGGT  CACTTTCGAC
1501 ATCGACGCCA  ACGGCATTGT  GCACGTCACC  GCCAAGGACA  AGGGCACCGG  CAAGGAGAAC
1561 ACGATCCGAA  TCCAGGAAGG  CTCGGGCCTG  TCCAAGGAAG  ACATTGACCG  CATGATCAAG
1621 GACGCCGAAG  CGCACGCCGA  GGAGGATCGC  AAGCGTCGCG  AGGAGGCCGA  TGTTGCTAAT
1681 CAAGCCGAGA  CATTGGTCTA  CCAGACGGAG  AAGTTCGTCA  AAGAACAGCG  TGAGGCCGAG
1741 GGTGGTTTCA  AGGTACCTGA  AGACACGCTG  AACAAGGTTG  ATGCCGCGGT  GGCGGAAGCG
1801 AAGGCGGCAC  TTGGCGGATC  GGATATTTTC  GCCATCAAGT  CGGCGATGGA  GAAGCTGGGC
1861 CAGGAGTCGC  AGGCTCTGGG  GCAAGCGATC  TACGAAGCAG  CTCAGGCTGC  GTCACAGGCC
1921 ACTGGCGCTG  CCCACCCCGG  CGCGAGCCCG  GGCGGTGCCC  ACCCGGGCTC  GGCTGATGAC
1981 GTTGTGGACG  CGGAGGTGGT  CGACGACGGC  CGGGAGGCCA  AGTGACGGAC  GGGTCGACCT
2041 GCAGCCAAGC  TTAATTAGCT  GAGCTTGGAC  TCCTGTTGAT  AGATCCAGTA  ATGACCTCAG
2101 AACTCCATCT  GGATTTGTTC  AGAACGCTCG  GTTGCCGCGG  GGCGTTTTTT  ATTGGTGAGA
2161 ATCCAAGCTA  GCTTGCGGAG  ATTTTCAGGA  GCTAAGGAAG  CTAAAATGGA  GAAAAAATC
2221 ACTGGATATA  CCACCGTTGA  TATATCCCAA  TGGCATCGTA  AAGAACATTT  TGAGGCATTT
2281 CAGTCAGTTG  CTCAATGTAC  CTATAACCAG  ACCGTTTCAG  TGGATATTAC  GGCCTTTTTA
2341 AAGACCGTAA  AGAAAAATAA  GCACAAGTTT  TATCCGGCCT  TTATTACAT  TCTTGCCCGC
2401 CTGATGAATG  CTCATCCGGA  ATTTCTGATG  GCAATGAAAG  ACGGTGAGCT  GGTGATATGG
2461 GATAGTGTTT  ACCCTTGTTA  CACCGTTTTT  CATGAGCAAA  CTGAAACGTT  TTCATCGCTC
2521 TGGAGTGAAT  ACCACGACGA  TTTCCGGCAG  TTTCTACACA  TATATTCGCA  AGATGTGGCG
2581 TGTTACGGTG  AAAACCTGGC  CTATTTCCCT  AAAGGGTTTA  TTGAGAATAT  GTTTTTTCGT
2641 TCAGCCAATC  CCTGGGTGAG  TTTACCAGT  TTTGATTAA  ACGTGGCCAA  TATGGACAAC
2701 TTCTTCGCCC  CCGTTTTTCA  CATGGGCAA  TATTATACGC  AAGGCGACAA  GGTGCTGATG
2761 CCGCTGGCGA  TTCAGTTTCA  TCATGCCGTT  TGTGATGGCT  TCCATGTCGG  CAGAATGCTT
2821 AATGAATTAC  AACAGTACTG  CGATGAGTGG  CAGGGCGGGG  CGTAATTTTT  TTAAGGCAGT
2881 TATTGGTGCC  CTTAAACGCC  TGGGGTAATG  ACTCTCTAGC  TTGAGGCATC  AAATAAACG
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Fig. 10

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2941 AAAGGCTCAG TCGAAAGACT GGGCCTTTTCG TTTTATCTGT TGTTCGTCGG TGAACGCTCT
3001 CCTGAGTAGG ACAAATCCGC CCTCTAGAGC TGCCTCGCGC GTTTCGGTGA TGACGGTGAA
3061 AACCTCTGAC ACATGCAGCT CCCGGAGACG GTCACAGCTT GTCTGTAAGC GGATGCCGGG
3121 AGCAGACAAG CCCGTCAGGG CGCGTCAGCG GGTGTTGGCG GGTGTCGGGG CGCAGCCATG
3181 ACCCAGTCAC GTAGCGATAG CGGAGTGTAT ACTGGCTTAA CTATGCGGCA TCAGAGCAGA
3241 TTGTACTGAG AGTGCACCAT ATGCGGTGTG AAATACCGCA CAGATGCGTA AGGAGAAAAT
3301 ACCGCATCAG GCGCTCTTCC GCTTCCTCGC TCACTGACTC GCTGCGCTCG GTCGTTCCGGC
3361 TGCGGCGAGC GGTATCAGCT CACTCAAAGG CGGTAATACG GTTATCCACA GAATCAGGGG
3421 ATAACGCAGG AAAGAACATG TGAGCAAAAG GCCAGCAAAA GGCCAGGAAC CGTAAAAAGG
3481 CCGCGTTGCT GCGCTTTTTT CATAGGCTCC GCCCCCTGA CGAGCATCAC AAAAATCGAC
3541 GCTCAAGTCA GAGGTGGCGA AACCCGACAG GACTATAAAG ATACCAGGCG TTTCCCCCTG
3601 GAAGCTCCCT CGTGCGCTCT CCGTTCGCGA CCCTGCCGCT TACCGGATAC CTGTCCGCCCT
3661 TTCTCCCTTC GGAAGCGTG GCGCTTTCTC ATAGCTCACG CTGTAGGTAT CTCAGTTCGG
3721 TGTAGGTCGT TCGCTCCAAG CTGGGCTGTG TGCACGAACC CCCCCTCAG CCCGACCGCT
3781 GCGCCTTATC CGGTAACAT CTCTTGAGT CCAACCCGGT AAGACACGAC TTATCGCCAC
3841 TGGCAGCAGC CACTGGTAAC AGGATTAGCA GAGCGAGGTA TGTAGGCGGT GCTACAGAGT
3901 TCTTGAAGTG GTGGCCTAAC TACGGCTACA CTAGAAGGAC AGTATTTGGT ATCTGCGCTC
3961 TGCTGAAGCC AGTTACCTTC GGAAAAGAG TTGGTAGCTC TTGATCCGGC AAACAAACCA
4021 CCGCTGGTAG CCGTGGTTTT TTTGTTTGCA AGCAGCAGAT TACGCGCAGA AAAAAAGGAT
4081 CTCAAGAAGA TCCTTTGATC TTTTCTACGG GGTCTGACGC TCAGTGGAAC GAAAACTCAC
4141 GTTAAGGGAT TTTGGTCATG AGATTATCAA AAAGGATCTT CACCTAGATC CTTTTAAATT
4201 AAAAAAGAG TTTTAAATCA ATCTAAAGTA TATATGAGTA AACTTGGTCT GACAGTTACC
4261 AATGCTTAAT CAGTGAGGCA CCTATCTCAG CGATCTGTCT ATTTCCGTTCA TCCATAGTTG
4321 CCTGACTCCC CGTCGTGTAG ATAACACGA TACGGGAGGG CTTACCATCT GGCCCCAGTG
4381 CTGCAATGAT ACCGCGAGAC CCACGCTCAC CGGCTCCAGA TTTATCAGCA ATAAACCAGC
4441 CAGCCGGAAG GGCCGAGCGC AGAAGTGGTC CTGCAACTTT ATCCGCCTCC ATCCAGTCTA
4501 TTAATTGTTG CCGGGAAGCT AGAGTAAGTA GTTCGCCAGT TAATAGTTTG CGCAACGTTG
4561 TTGCCATTGC TACAGGCATC GTGGTGTAC GCTCGTCGTT TGGTATGGCT TCATTAGCT
4621 CCGGTTCCCA ACGATCAAGG CGAGTTACAT GATCCCCCAT GTTGTGCAAA AAAGCGGTTA
4681 GCTCCTTCGG TCCTCCGATC GTTGTGAGAA GTAAGTTGGC CGCAGTGTTA TCACTCATGG
4741 TTATGGCAGC ACTGCATAAT TCTCTTACTG TCATGCCATC CGTAAGATGC TTTTCTGTGA
4801 CTGGTGAGTA CTCAACCAAG TCATTCTGAG AATAGTGTAT GCGGCGACCG AGTTGCTCTT
4861 GCCCGGCGTC AATACGGGAT AATACGCGC CACATAGCAG AACTTTAAAA GTGCTCATCA
4921 TTGGAAAACG TTCTTCGGGG CGAAAACCTCT CAAGGATCTT ACCGCTGTTG AGATCCAGTT
4981 CGATGTAACC CACTCGTGCA CCCAACTGAT CTTCAGCATC TTTTACTTTC ACCAGCGTTT
5041 CTGGGTGAGC AAAAACAGGA AGGCAAAATG CCGCAAAAAA GGGAATAAGG GCGACACGGA
5101 AATGTTGAAT ACTCATACTC TTCCTTTTTT AATATTATTG AAGCATTATC CAGGGTTATT
5161 GTCTCATGAG CGGATACATA TTTGAATGTA TTTAGAAAAA TAAACAAATA GGGGTTCCGC
5221 GCACATTTCC CCGAAAAGTG CCACCTGACG TCTAAGAAAC CATTATTATC ATGACATTAA
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Fig. 10

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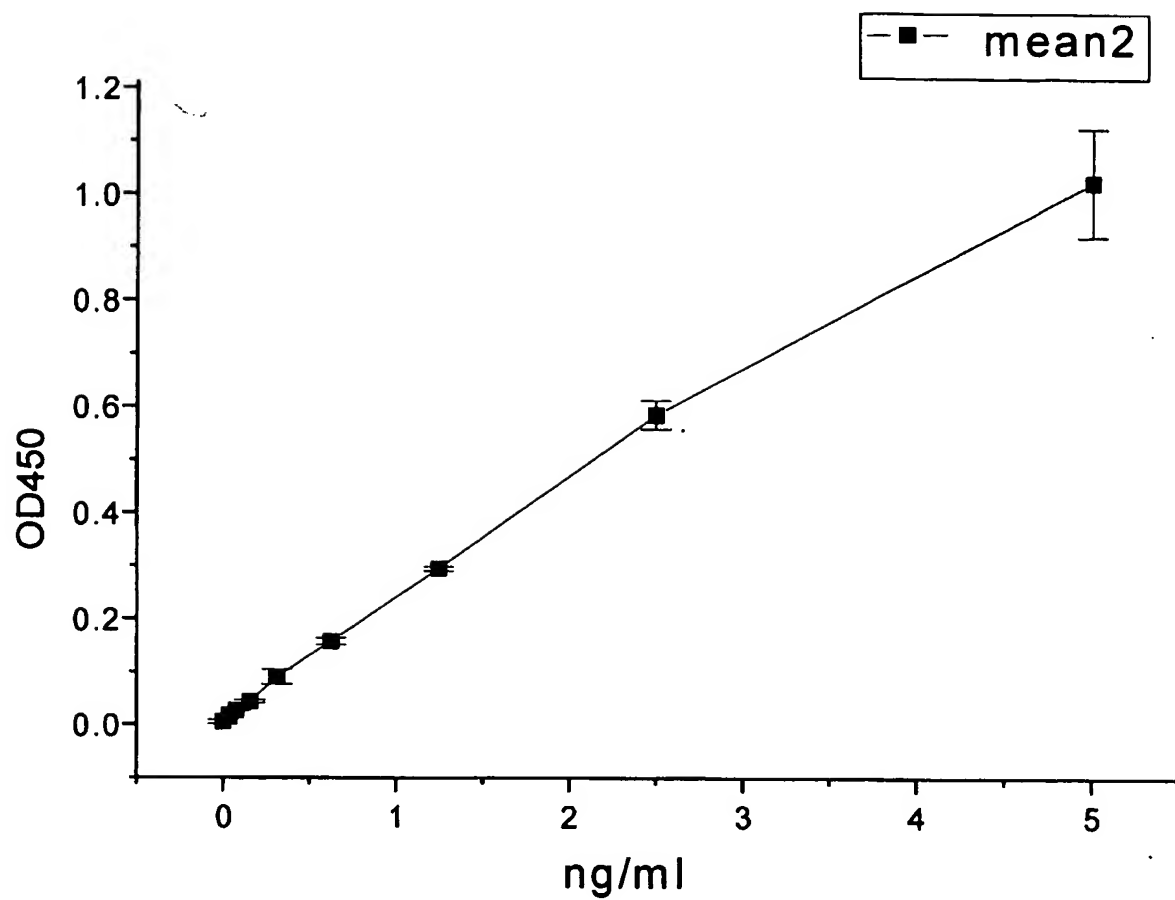


Fig. 11